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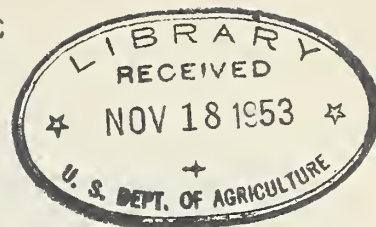
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UNITED STATES DEPARTMENT OF AGRICULTURE  
Agricultural Research Administration  
U.S. Bureau of Animal Industry  
Washington, 25, D. C.



3 BLUE TONGUE IN SHEEP //

On March 13, 1953 the United States Department of Agriculture announced that a disease in sheep known as blue tongue had been definitely identified in the United States (in California) for the first time.

The following information has been compiled from available sources of information and is intended as an aid to State and Federal livestock sanitary officials, practicing veterinarians, and others interested in this disease.

Conditions in sheep suggestive of blue tongue should be reported immediately to State or Federal disease control officials in your State.

ETIOLOGY

Blue tongue is an infectious virus disease of sheep. Cattle may harbor the virus but they do not show clinical symptoms. A species of *Culicoides*, a biting insect about the size of the head of a common pin (popularly called sand flies, midgets, punkies, and no-see-ums) is believed to be a carrier. Other biting insects may help to spread the disease. There is no evidence that it is spread by direct contact or that it is transmissible to man. The disease is seasonal, usually appearing about midsummer and continuing until cool weather when the *Culicoides* become inactive.

HISTORY AND DISTRIBUTION

Dr. R. A. Alexander, Director of Veterinary Services, Union of South Africa, at the invitation of the Department of Agriculture, recently spent several weeks in the United States to investigate the areas from which the disease had been reported and to advise the Department. He pointed out that up to that time blue tongue had been found only on the African Continent, with the exception of Cyprus and Palestine. It now has appeared in flocks in the United States in California, Utah, Texas and Arizona. That brings up the question of how the disease got into this country. There is no record of sheep being imported into America from South Africa. A few sheep have been imported from Australia, but there is no blue tongue in Australia.

Dr. Alexander stated that, from discussions with veterinarians and farmers in California, he is convinced that the disease has been in that State for not less than seven years. In 1951 Doctors Hardy and Price, Texas Agricultural Experiment Station, investigated a condition in sheep in western Texas strikingly similar to blue tongue which they called "sore muzzle". It has since been determined that this condition is blue tongue. It has probably occurred in west Texas for twelve to fifteen years or perhaps longer.

### SYMPTOMS AND LESIONS

The symptoms appear in artificial infection after an incubation period of seven to nine days and in natural infection, nine to eleven days. The disease is characterized by reduced appetite, lassitude, with a rise of temperature up to 106° or 107.5° F., followed by swelling and inflammation of the nose, tongue, gums, and throat. The mucous membrane of the affected parts become a bluish or purplish color, hence the name blue tongue. The exposed parts often bleed. The animal becomes stiff and lame, and at this stage the symptoms are slightly similar to those of foot-and-mouth disease. In South Africa, mortality rates have run as high as 90 percent. So far, the disease has been less virulent in the United States, and the mortality rates have been considerably lower, usually around 5 to 20 percent of infected animals. An autopsy on animals that have been affected with blue tongue shows local changes in the head and buccal mucosa, degenerative changes in the muscles, and signs of general septicemia and of anemia if the disease has been protracted.

In California last year the disease appeared in flocks totalling about 325,000 head. Not all of the sheep were infected, but losses were estimated at about 15,000 head. Many animals recovered but losses were heavy because of depreciation in wool quality, as well as loss in condition and body weight.

### COURSE OF DISEASE

Owners first become aware of the disease in their flocks when they see the rapid weight loss of affected sheep, the inflamed muzzles and the stiff gait. Morbidity rates are, in most instances, 10 to 30 percent; however, very mild forms of the disease may exist which are not readily recognizable among flocks of hundreds or thousands of sheep. The course of the disease is estimated to be ten to twenty-one days, and the flocks may be considered out of danger after four weeks. By far the majority of deaths are caused by either secondary pneumonia or screw-worm infection of the lips and muzzle. The remaining fatalities are caused by extreme weakness and emaciation.

Studies have revealed a higher incidence of the disease among year-old lambs or those over six months, and it is more evident in rams than ewes and mutton breeds rather than in wool breeds.

Those who have studied blue tongue closely stress that it appears in many different forms and degrees of virulency, varying from merely a slight stiffness with no death loss to cases with all of the pronounced symptoms attended by extreme degrees of morbidity and mortality. They also point out the similarity to big-head or photo-sensitization, contagious ecthyma (sore mouth), stiff lamb disease and founder.

### DIAGNOSIS

A clinical diagnosis of typical cases of blue tongue is not difficult and is probably sufficient in most areas where the disease has already been confirmed by animal inoculation. The mild and unusual forms present a

diagnostic problem. Definite diagnosis is established by the inoculation of blood or spleen material into susceptible sheep, which is presently the only known test for blue tongue.

#### TREATMENT AND CONTROL

The only satisfactory method of controlling blue tongue developed so far is vaccination. As soon as the virus of this disease was isolated at the University of California, workers there began passing it through chick embryos in an attempt to reduce its virulence so that it would be suitable for use as a vaccine. This has apparently been accomplished, and tests to determine its innocuity and potency are under way. If results of these tests are satisfactory the material will be released to commercial laboratories for the production of vaccine.

Dr. G. H. Hart of the University of California has agreed to test a limited amount of material from States in which necessary facilities for such tests are not available. Permission to send specimens to the University should be obtained by telephone or telegraph before any material is forwarded. It is important not to overload the research workers with diagnostic material and thus slow down the research program.

Quarantine of affected areas or affected flocks remain a problem. In California the State is issuing "hold-orders" on all affected flocks, and sheep from such flocks are moved only with a special permit. Emphasis is being placed on preventing interstate shipments from the affected flocks.

Determining how long a quarantine should remain on infected flocks or infected areas is also a problem. The quarantine should be removed as soon as feasible in order to prevent unnecessary economic losses to the owner. Since the disease is not spread by direct contact it seems reasonable to permit sheep not visibly affected to be moved to areas where frosts have rendered the *Culicoides* inactive.

